

VALLEY WASTE DISPOSAL COMPANY

1400 EASTON DRIVE, SUITE 139-B
BAKERSFIELD, CALIFORNIA 93309

May 24, 1996

Mr. William F. Pfister
Supervising Engineering Geologist
Regional Water Quality Control Board
3614 E. Ashlan Avenue
Fresno, CA 93726

Dear Mr. Pfister:

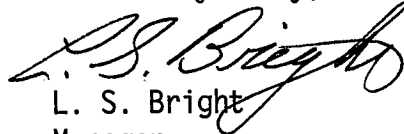
Enclosed please find the "Drilling and Data Acquisition Report, Race Track Hill District, Edison Oil Field, Kern County, California". This report is being submitted in compliance with General Order No. 92-110 which requires that a plan be submitted for achieving compliance.

We believe that this "Drilling and Data Acquisition Report" proves that our Race Track Hill water collection and transfer facility, located in Sec. 34, T.29S., R.29E. does not pose a threat to ground water quality and that no further action should be required for continued operation of the site. As the report states, the ponds that are continuously used for the collection and transfer of produced water are gunite-lined, thereby providing an adequate liner to prevent any leakage.

If a public hearing before the Regional Water Quality Control Board is necessary to demonstrate that this facility does not pose a threat to ground water quality, then please consider this letter to be a request for that hearing.

Thank you very much for your consideration. We look forward to your response.

Yours very truly,


L. S. Bright
Manager

Enclosure

LSB:kc

DRILLING AND DATA ACQUISITION REPORT
RACE TRACK HILL DISTRICT
EDISON OIL FIELD
KERN COUNTY, CALIFORNIA

VALLEY WASTE DISPOSAL COMPANY

22 MAY 1996

K/J 962306.00

Kennedy/Jenks Consultants

Engineers and Scientists

200 New Stine Road, Suite 115
Bakersfield, California 93309
805-835-9785
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22 May 1996

Mr. Larry Bright, Manager
Valley Waste Disposal Company
1400 Easton Drive, Suite 139-B
Bakersfield, California 93309

Subject: Drilling and Data Acquisition Report
Race Track Hill District
Edison Oil Field
Kern County, California
K/J 962306.00

Dear Mr. Bright:

Kennedy/Jenks Consultants is pleased to present this Drilling and Data Acquisition Report (Report) for the Race Track Hill District facility located in the Edison Oil Field. This Report summarizes the field activities performed on 12-14 March 1996 and the chemical and geotechnical results of soil samples collected beneath the surface impoundments. Services provided by Kennedy/Jenks Consultants were performed in accordance with the scope, terms, and conditions of our agreement dated 28 February 1996.

Four (4) copies of the Report are being submitted at this time. It is Kennedy/Jenks Consultants understanding that a copy of the Report will be forwarded by Valley Waste Disposal Company to the Regional Water Quality Control Board for their review.

If you have any questions regarding this Report or require additional information, please contact me at (805) 835-9785.

Very truly yours,

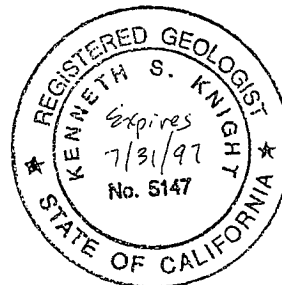
KENNEDY/JENKS CONSULTANTS



Ken Knight, R.G.
Project Manager

Attachment

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VALLEY WASTE DISPOSAL COMPANY
DRILLING AND DATA ACQUISITION REPORT
RACE TRACK HILL DISTRICT
EDISON OIL FIELD
KERN COUNTY, CALIFORNIA

22 May 1996

K/J 962306.00

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
1.0 INTRODUCTION.....	2
1.1 Background.....	2
1.2 Scope of Investigation.....	2
1.3 Site Location.....	3
1.4 Hydrogeologic Conditions	3
2.0 FIELD INVESTIGATION METHODS	3
2.1 Pre-field Activities.....	3
2.2 Soil Borings	3
2.3 Soil Sampling Procedures.....	4
3.0 LABORATORY ANALYTICAL METHODS.....	5
4.0 DISCUSSION OF INVESTIGATION RESULTS.....	5
4.1 Field Investigation Results.....	5
4.2 Analytical Results	5
5.0 CONCLUSION AND RECOMMENDATION.....	6
6.0 LIMITATION OF STUDY	7

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>
1	Site Location Map
2	Borehole Location Map

LIST OF APPENDICES

<u>Appendix</u>	<u>Title</u>
A	Soil Boring Logs
B	Soil Sample Geotechnical and Chemical Analysis Report
C	Produced Water Chemical Analysis Report

EXECUTIVE SUMMARY

On 29 May 1992, the Regional Water Quality Control Board, Central Valley Region (Board) issued General Order No. 92-110 that prescribes waste discharge requirements for the discharge of oil field produced water to surface impoundments in the Edison Oil Field, located east of Bakersfield, California. By 29 May 1996, impoundment operators must either cease surface disposal at facilities that do not meet California Code of Regulations, Title 23, Chapter 15 standards for Class II impoundments or demonstrate that discharges from these facilities do not pose a threat to ground water quality. Valley Waste Disposal Company (Valley Waste) operates their Race Track Hill District facility (Site) within the Edison Oil Field as a collection and processing facility prior to pumping the produced water to a Board-approved disposal facility located outside the field boundary. In response to the Board order, Valley Waste performed a drilling and data acquisition investigation beneath the Site to determine if produced water has leaked into underlying sediments. Ground water in the area is of good quality and is found at a depth of approximately 350 to 400 feet below ground surface (bgs).

The field investigation included the drilling of three angled borings beneath two gunite-lined ponds and one earthen impoundment to characterize the physical and chemical conditions of the sediments beneath the Site. Soil samples were collected from approximately 60 to 70 feet bgs and analyzed for produced water trace constituents (sodium, chloride, boron, and hydrocarbons) and physical properties (porosity, permeability, and water saturation). The drilling investigation found that the sediments underlying the Site are fine- to medium-grained sands and silty sands with occasional lenses of coarse sand and gravel. Sandy deposits are dry to slightly moist and loose, whereas the silty intervals are slightly moist to moist and medium dense in consistency. No water-saturated or hydrocarbon-impacted sediments were observed during drilling or sample processing.

Soil samples collected from 60 to 70 feet bgs in the three borings range from 36% to 68% water saturation, except for one sample which was reported with 99.6%. To verify this result, the remaining portion of the sample was re-tested and found to contain 99.9% water saturation. A visual re-examination of soil cuttings and core samples retained from the investigation did not support these analytical results, suggesting the anomalous water saturation results are attributed to a thin stratigraphic variation that was not observed in samples collected immediately above or below this interval.

Chemical analyses of soil samples for produced water trace constituents indicate the sediments beneath the facility do not contain elevated concentrations of sodium and chloride, and that boron and total recoverable petroleum hydrocarbons are below the test method detection limits. If the soil sample reported to be water-saturated is accurate, then the source of water is not associated with oil field produced water because boron, a highly soluble and mobile element, would have been detected at elevated concentrations relative to native conditions. Produced water from the facility contains 13 mg/L boron and the detection limit is 0.10 mg/L. Therefore, based on drilling observations and laboratory testing, the surface impoundments at the Race Track Hill facility do not appear to have leaked into underlying sediments and do not pose a threat to ground water quality.

**VALLEY WASTE DISPOSAL COMPANY
DRILLING AND DATA ACQUISITION REPORT
RACE TRACK HILL DISTRICT
EDISON OIL FIELD
KERN COUNTY, CALIFORNIA**

22 May 1996

K/J 962306.00

1.0 INTRODUCTION

1.1 Background

This report presents the results of a drilling and data acquisition investigation performed by Kennedy/Jenks Consultants (Kennedy/Jenks) for Valley Waste Disposal Company (Valley Waste) at their Race Track Hill District facility located in the Edison Oil Field east of Bakersfield, California (Site). Figure 1 shows the location of the Site and general vicinity.

The investigation was conducted by Valley Waste in response to a waste discharge compliance order issued by the Regional Water Quality Control Board (Board) to operators of produced water impoundments in the Edison Oil Field. By 29 May 1996, impoundment operators must either cease surface disposal at facilities that do not meet California Code of Regulations, Title 23, Chapter 15 standards for Class II impoundments or demonstrate to the Board that these facilities do not pose a threat to ground water quality.

The Race Track Hill facility is an oil field produced water collection and transfer facility, not a disposal site. Produced water received at the facility is pumped via pipeline to a Board-approved disposal site located outside the field boundary. The Site includes three gunite-lined receiving and shipping ponds, two small earthen impoundments containing oil that is skimmed from the receiving ponds, and a dry earthen impoundment for emergency overflow conditions. In 1995, the daily average throughput of produced water at the Site was approximately 7,000 bbl/d.

1.2 Scope of Investigation

The field investigation consisted of drilling three angled borings beneath two gunite-lined ponds and one earthen impoundment to characterize the physical and chemical conditions of sediments beneath the Site. Soil samples were collected from approximately 60 and 70 feet below ground surface (bgs) and analyzed for produced water trace constituents (sodium, chloride, boron, and hydrocarbons) and physical properties (porosity, permeability, and water saturation) to determine if the

impoundments have leaked into underlying sediments. Figure 2 shows the locations of the borings in relation to Site facilities.

This report describes the drilling and soil sample collection procedures used in the investigation, the sediment types beneath the Site, the chemical and geotechnical test methods used to evaluate the samples, and the results of laboratory testing. Also included are maps that show the location of the Site and soil borings, detailed lithologic logs for each soil boring, a summary table of the chemical and geotechnical test methods and results for the soil samples, and a copy of the chemical analysis for produced water received at the Site.

1.3 Site Location

The area of investigation is located approximately 4 miles east of Bakersfield in the southwest quarter corner of Sec. 34, T29S, R29E, MDB&M (Figure 1). The Site is located within the boundary of the Edison Oil Field and is surrounded by open farmland, citrus groves, grape vineyards, and oil production facilities.

1.4 Hydrogeologic Conditions

Hydrogeologic data maintained by the Kern County Water Agency shows the depth to the unconfined aquifer in the vicinity of the Site is approximately 350 to 400 feet bgs. The Site is located on the eastern side of the Edison Fault which crosses near the eastern limit of the unconfined aquifer at the base of the Sierra Mountain foothills. Water quality within a 2-mile radius of the Site is generally good, with total dissolved solids (TDS) ranging from approximately 500 to 1,000 parts per million (ppm). The primary use of ground water in the area is for agricultural irrigation.

2.0 FIELD INVESTIGATION METHODS

2.1 Pre-field Activities

Prior to initiating the field investigation, Kennedy/Jenks prepared a site-specific Health & Safety Plan for the safe conduct of our employees while working at the Site. The proposed boring locations were then staked for Valley Waste approval. After the drilling locations were approved, Underground Services Alert was contacted to check for public and private underground utilities (electric, gas, phone/cable, water, petroleum pipelines) in the area of investigation. No public or private utilities are located beneath the subject property. Onsite, an underground electrical conduit to several light poles was located and marked along the northern edge of the impoundments prior to drilling.

2.2 Soil Borings

A total of three soil borings were drilled at the Site (Figure 2). The drilling subconsultant used in the investigation was Melton Drilling Company of Bakersfield, California. The borings were drilled with a B-53 hollow-stem auger rig set at a 27° angle from vertical to extend the borings beneath the impoundments. Each boring was advanced with six-

inch hollow stem augers to a total drill depth of 80 feet. At a 27° angle, the true vertical depth (TVD) of the borings is approximately 71 feet bgs, with a horizontal offset distance of approximately 36 feet from the surface location to the bottom hole location.

The horizontal distance to the bottom hole location from the edge of fluid in the impoundments varied for each boring. Boring B-1 was located 22 feet back from the edge of water in the main shipping pond due to an overflow gutter and electrical conduit located along the edge of the impoundment. This setback distance for boring B-1 places the bottom hole location approximately 14 feet beyond the edge of water in the main shipping pond. Boring B-2 was located 12 feet from the eastern edge of the receiving ponds, which places the bottom of the boring approximately 24 feet beyond the edge of water in the pond. Boring B-3 was setback 15 feet from the eastern edge of the earthen impoundment, which places the bottom hole location approximately 21 feet beyond the edge of oil contained in the structure.

Drill cuttings were collected in plastic zipper baggies at five-foot intervals from the surface to total depth to use for lithologic descriptions and headspace monitoring for volatile organic compounds (VOCs). Soil samples submitted for laboratory testing were collected from each boring at drill depths of 70 and 80 feet, which are equivalent to 62 and 71 feet TVD with horizontal offsets of 32 and 36 feet, respectively. In addition, a background soil sample was collected in boring B-1 at a drill depth of 10 feet (approximately 9 feet TVD and 17.5 feet back from the edge of water) to establish native soil conditions at the Site.

The borings were logged by a California Registered Geologist who supervised the collection and processing of the undisturbed soil samples. Copies of the lithologic logs for each boring are provided in Appendix A. Following the completion of sample collection and lithologic descriptions, each boring was abandoned from total depth to the surface using 3/8-inch hydrated bentonite chips.

2.3 Soil Sampling Procedures

Soil samples were collected in three six-inch brass liners using an 18-inch modified California drive sampler. Upon recovery, one liner was emptied into a plastic zipper bag for hydrocarbon vapor monitoring with a photo-ionization device (PID), a second sample liner was retained for laboratory analyses, and the third sample was used for lithologic descriptions.

The sample liner selected for laboratory testing was sealed on both ends with Teflon™ sheets, plastic caps, and silicon tape. The samples were labeled according to Site name, borehole number, sample depth, and time, and placed in a chilled ice chest. A chain-of-custody form was completed at the Site and transported with the samples to Core Laboratories, Inc. (Core Lab) in Bakersfield for chemical and geotechnical testing.

The sampler, sample liners, and augers were steam cleaned prior to their initial use and between borings. The sampler was washed with a non-phosphate detergent and rinsed with deionized water between subsequent use in each boring to reduce the likelihood of cross-contamination of samples.

3.0 LABORATORY ANALYTICAL METHODS

A total of seven soil samples were submitted to Core Lab and analyzed for the chemical and geotechnical parameters listed below. Copies of the laboratory testing results and chain-of-custody form are provided in Appendix B.

CHEMICAL ANALYSIS

METHOD

Sodium (Na)	EPA 6010
Chloride (Cl)	EPA 325.3
Boron (B)	SM 4500-B
TRPH (Total Recoverable Petroleum Hydrocarbons)	EPA 418.1
Specific Conductance	EPA 120.1
Alkalinity by Titration	EPA 310.1
pH	EPA 9045

GEOTECHNICAL ANALYSIS (API-RP 40 Package)

Permeability (air)
Porosity (total)
Water Saturation (%)
Bulk Density (dry and natural)

4.0 DISCUSSION OF INVESTIGATION RESULTS

4.1 Field Investigation Results

In general, the sediments underlying the Site to a depth of approximately 70 feet bgs consist of fine- to medium-grained sands and silty sands with occasional lenses of coarse sand and gravel. The sandy deposits were observed to be dry to slightly moist and loose, whereas the silty intervals were slightly moist to moist and medium dense in consistency. Drill cuttings from the upper 35 feet of sediments typically were more moist than the deeper deposits, probably due to their finer texture and infiltration of rain water.

No saturated sediments were observed in any of the borings. Additionally, no hydrocarbon stains were observed and sample headspace monitoring did not detect any hydrocarbon vapors.

The finest-grained deposit encountered was a reddish-brown, moist, medium dense silt interval between 65 to 70 feet drill depth in boring B-1. This deposit appears to grade laterally into a silty sand in the other two borings. This silt interval is abruptly underlain by a loose, dry to slightly moist sand interval that includes a coarse, pebbly zone at the total drill depth of 80 feet in all three borings.

4.2 Analytical Results

Geotechnical and chemical analyses were performed on two deep samples from each boring and one background sample collected away from the produced water ponds. Appendix B contains a copy of the geotechnical and chemical test results.

Geotechnical tests on the background sample collected from approximately 9 feet bgs in boring B-1 report a water saturation of 90.8%, which is most likely due to the infiltration of seasonal rain water. Soil cuttings from the upper 35 feet in all three borings were generally more moist than the deeper sediments. Water saturations from the 70-ft. and 80-ft. samples in the borings were generally low, ranging from 36% to 68%, except sample B-1-70' which was reported with 99.6% water. A visual re-examination of soil cuttings and core samples retained from the investigation did not support the analytical results for sample B-1-70', so the remaining lab sample was re-tested as sample B-1-70'rr (rerun). The results were almost identical to the first tests, with the rerun sample reporting 99.9% water saturation. In contrast, sample B-1-80' collected below this interval contained only 41.5% water saturation. The anomalous water saturation results for samples B-1-70' and B-1-70'rr are attributed to a thin stratigraphic variation that was not observed in samples collected immediately above or below it or in the other borings.

Chemical analysis of the samples included testing for produced water trace constituents such as sodium, chloride, boron, and total recoverable petroleum hydrocarbons (TRPH), as well as specific conductance, alkalinity, and pH. In general, the soil samples do not contain elevated concentrations of sodium and chloride, and both boron and TRPH are reported below the test method detection limits. For samples B-1-70' and B-1-70'rr that reported 99.6% and 99.9% water saturations, respectively; neither sample contained detectable amounts of boron, a highly soluble and mobile trace constituent. If these samples are water-saturated as reported, then the source is not associated with oil field produced water because boron would have been detected at an elevated concentration relative to native conditions. Produced water collected from the Race Track Hill facility contains 13 mg/L boron and the detection limit for boron is only 0.10 mg/L. A copy of the chemical analysis report for produced water collected at the Race Track Hill facility is provided in Appendix C.

5.0 CONCLUSION AND RECOMMENDATION

Based on drilling observations and laboratory testing for chemical constituents and geotechnical parameters, the surface impoundments at the Race Track Hill facility do not appear to have leaked into underlying sediments and do not pose a threat to ground water quality. Subsurface conditions beneath the Site to a depth of 70 feet bgs are dry to slightly moist and ground water occurs at a depth of 350 to 400 feet bgs. Therefore, Valley Waste should forward this report to the Regional Water Quality Control Board prior to the compliance order deadline of 29 May 1996 and request a public hearing to demonstrate that water quality objectives have not been violated and that no further action should be required for continued operation of the Site.

6.0 LIMITATION OF STUDY

The scope of this investigation was not intended to be a comprehensive inspection or assessment of all environmental conditions that might exist at the Site. This report, our opinions, and the recommendations presented herein apply to Site conditions existing at the time of the investigation. Kennedy/Jenks Consultants is unable to report or accurately predict events which may impact the Site following this investigation, whether occurring naturally or caused by external forces. Kennedy/Jenks assumes no responsibility for conditions it was not authorized to investigate or conditions generally recognized as environmentally unacceptable at the time services were performed. Kennedy/Jenks is not responsible for changes in applicable environmental standards, practices, or regulations following the performance of services.

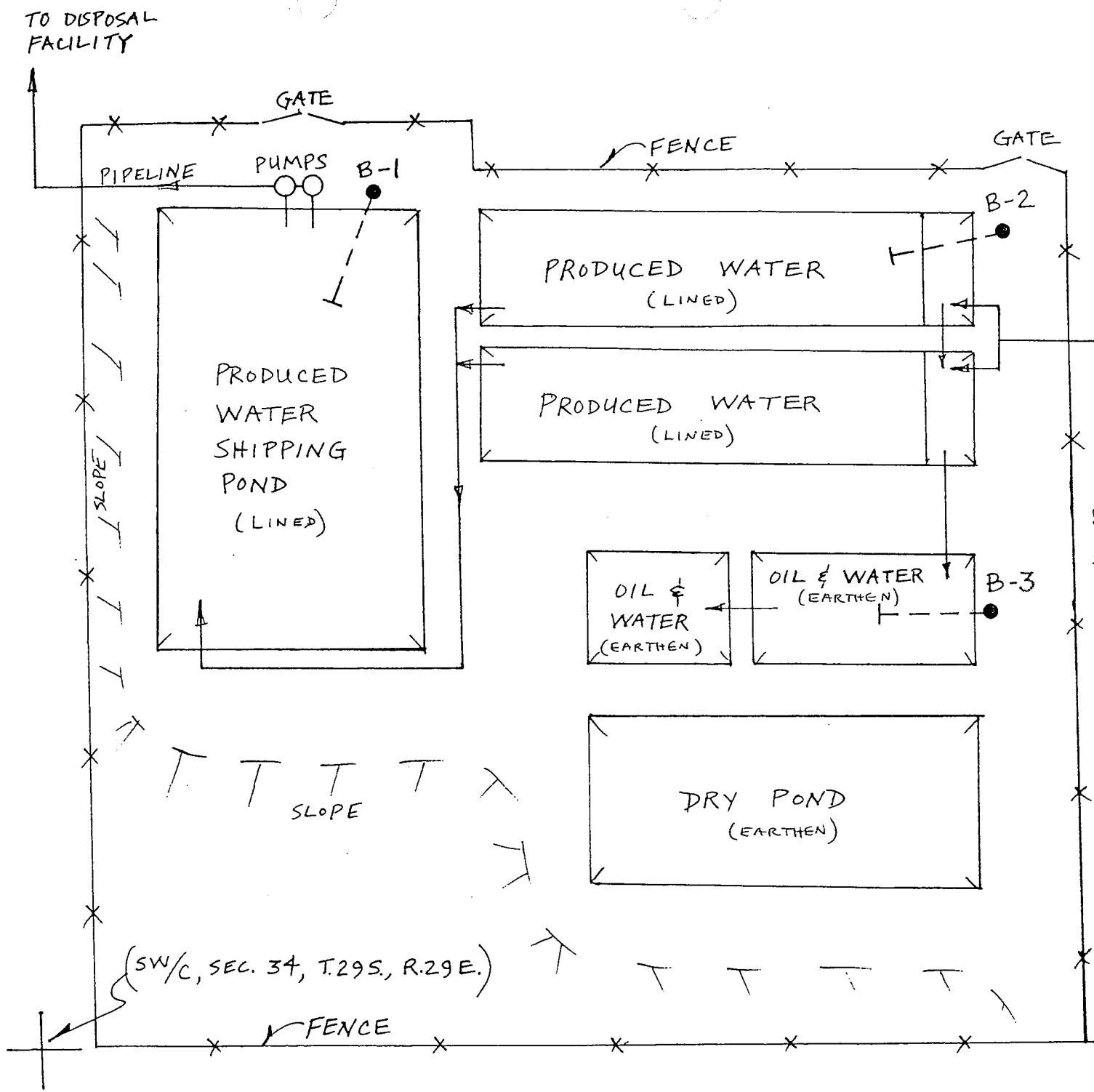
FIGURES



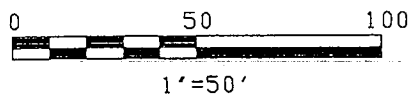
Kennedy/Jenks Consultants
 Valley Waste Disposal Company
 Race Track Hill District
 Edison Oil Field

Site Location Map

K/J 962306.00
 April 1996
Figure 1



BOTTOM HOLE LOCATION ———● SOIL BORING SURFACE LOCATION



Kennedy/Jenks Consultants
Valley Waste Disposal Company
Race Track Hill District
Edison Oil Field

Borehole Location Map

K/J 962306.00
April 1996

Figure 2

APPENDIX A
SOIL BORING LOGS

Boring & Well Construction Log

Kennedy/Jenks

BORING LOCATION Race Point Hill - Edison		Boring/Well Name B-1	
DRILLING COMPANY Melton Drilling		DRILLER Sonny	
DRILLING METHOD(S) Hollow Stem Auger @ 27 degrees		Project Name Valley Waste	
ISOLATION CASING None		Project Number 962306.00	
BLANK CASING None		ELEVATION AND DATUM Surface	
PERFORATED CASING None		TOTAL DEPTH 80.0	
SIZE AND TYPE OF FILTER PACK None		DATE STARTED 3/12/96	
SEAL Hydrated Bentonite Chips		DATE COMPLETED 3/12/96	
GROUT None		STATIC WATER ELEVATION unknown	
		NORTHING	
		EASTING	
		LOGGED BY Ken Knight	
		SAMPLING METHODS Split Spoon	
		WELL COMPLETION <input type="checkbox"/> SURFACE HOUSING <input type="checkbox"/> STAND PIPE _____ FT.	

SAMPLES			Depth (feet)	WELL CONSTRUCTION	USCS Log	Lithology	OVM	SAMPLE DESCRIPTION and DRILLING REMARKS
TYPE No.	Recovery (feet)	PID						
			5	B-1-10' (LAB)	SM			Note - rig @ 27 degrees from vertical TD = 80' TVD = 71' = (sin 63 degrees x 80) Borehole 6' from edge of overflow drain; 22' from water
			10					<u>SILTY SAND</u> : with clay, fine to coarse grain, minor gravel chips to 1/2", brown, slightly moist, well graded, no odor or stain.
			15					same, with some coarse gravel to 1.5".
			20		SP			same, gravel 1/2".
			25		SM			<u>SAND</u> : fine to medium grain, minor silt, light brown, slightly moist, poorly graded, no odor or stain.
			30		SM-SC			<u>SILTY SAND</u> : with 20% gravel to 1", brown, slightly moist, well graded, no odor or stain.
			35		SM			<u>SILTY-CLAYEY SAND</u> : with minor gravel, brown, moist, no odor or stain.

Project Name <u>Valley Waste</u>			Project Number <u>96230000</u>		Boring/Well Name <u>B-1</u>			
SAMPLES			Depth (feet)	WELL CONSTRUCTION	USCS Log	Lithology	OVM	SAMPLE DESCRIPTION and DRILLING REMARKS
TYPE No.	Recovery (Feet)	PID						
			40		SM			<u>SILTY SAND</u> : medium to coarse grain, minor gravel, well graded, moist, no odor or stain.
								(same) increase in gravel
			45					Cobble Zone with Silty Sand Intervals
			50		SM			
			55					
			60	B-1-60'	SW			<u>SAND</u> : fine to medium grain, minor silt, coarse sand and gravel, loose, slightly moist, well graded, no odor or stain.
			65	B-1-65'	ML			<u>SANDY SILT</u> : reddish brown, minor clay + fine sand, soft, slightly moist, no odor or stain.
			70	B-1-70' (LAB)	SM			<u>SILTY SAND</u> : fine grain, minor clay, brown, medium dense, slightly moist, no odor or stain.
			75	B-1-75'				(same)
			80	B-1-80' (LAB)	SW			<u>SAND</u> : medium grain with minor fine, coarse, + gravels, loose, well graded, slightly moist, no odor or stain.

Boring & Well Construction Log

Kennedy/Jenks

BORING LOCATION Race Track Hill - Edison		Boring/Well Name B-2	
DRILLING COMPANY Melton Drilling		DRILLER Sonny	
DRILLING METHOD(S) Hollow Stem Auger @ 27 degrees		DRILL BIT(S) SIZE 8" O.D.	
ISOLATION CASING None		Project Name Valley Waste	
BLANK CASING None		Project Number 962306.00	
PERFORATED CASING None		ELEVATION AND DATUM Surface	
SIZE AND TYPE OF FILTER PACK None		TOTAL DEPTH 80.0	
SEAL Hydrated Bentonite Chips		DATE STARTED 3/13/96	
GROUT None		DATE COMPLETED 3/13/96	
		STATIC WATER ELEVATION unknown	
		NORTHING	
		EASTING	
		LOGGED BY Ken Knight	
		SAMPLING METHODS Split Spoon	
		WELL COMPLETION <input type="checkbox"/> SURFACE HOUSING <input type="checkbox"/> STAND PIPE _____ FT.	

SAMPLES			Depth (feet)	WELL CONSTRUCTION	USCS Log	Lithology	OVM	SAMPLE DESCRIPTION and DRILLING REMARKS
TYPE No.	Recovery (feet)	PID						
			5		SW			Note: 27 degrees = 80' TD = 71' TVD Horizontal offset from edge of water approximately 12'.
			10					(same)
			15		SW			(same) increase in coarse size with occasional cobbles.
			20					(same) medium to coarse grain with silt and pebbles, moist, no odor or stain.
			25		SW			(same) Some Cobble Zones
			30					(same) slight increase in moisture; soil clumps together when squeezed.
			35		SW			(same) some Cobbles

Project Name <u>Valley Waste</u>			Project Number <u>96236 0</u>		Boring/Well Name <u>B-2</u>			
SAMPLES			Depth (Feet)	WELL CONSTRUCTION	USCS Log	Lithology	OVM	SAMPLE DESCRIPTION and DRILLING REMARKS
TYPE No.	Recovery (Feet)	PID						
			40		SW			(same) very consistent soil type with Cobbles. Very well sorted.
			45					
			50		SW			(same) medium to coarse sand with Silt and gravel slightly moist, no odor or stain.
			55					
			60	B-2-60'	SM			<u>SILTY SAND</u> : fine to medium grain with minor coarse fragments, rusty brown, slightly moist, no odor or stain.
			65					
			70	B-2-70' (LAB)	SM			(same) as 60', <u>a little drier</u> , and loose.
			75					
			80	B-2-80' (LAB)	SW			<u>SAND</u> : fine to medium grain with 19-20% coarse sand + pebbles, light brown, loose, <u>almost dry</u> , very well graded, no odor or stain.

Boring & Well Construction Log

Kennedy/Jenks

BORING LOCATION Raccoon Hill - Edison				Boring/Well Name B-3			
DRILLING COMPANY Melton Drilling				DRILLER Sonny		Project Name Valley Waste	
DRILLING METHOD(S) Hollow Stem Auger @ 27 degrees				DRILL BIT(S) SIZE 8" O.D.		Project Number 962306.00	
ISOLATION CASING None				FROM TO FT.		ELEVATION AND DATUM Surface	
BLANK CASING None				FROM TO FT.		TOTAL DEPTH 80.0	
PERFORATED CASING None				FROM TO FT.		DATE STARTED 3/14/96	
SIZE AND TYPE OF FILTER PACK None				FROM TO FT.		DATE COMPLETED 3/14/96	
SEAL Hydrated Bentonite Chips				FROM TO FT. 0 80		STATIC WATER ELEVATION unknown	
GROUT None				FROM TO FT.		NORTHING	
						LOGGED BY Ken Knight	
						EASTING	
						SAMPLING METHODS Split Spoon	
						WELL COMPLETION <input type="checkbox"/> SURFACE HOUSING <input type="checkbox"/> STAND PIPE _____ FT.	

SAMPLES			Depth (feet)	WELL CONSTRUCTION	USCS Log	Lithology	OVM	SAMPLE DESCRIPTION and DRILLING REMARKS
TYPE No.	Recovery (feet)	PID						
			5		SM			Note: Drilled @ 27 degrees from vertical TD = 80' TVD = 71' Located approximately 15' east of oil/water pond @ southeast end.
			10					<u>SILTY SAND</u> : fine grain, brown, moist, no odor or stain.
								(same) slightly moist, light brown.
								some Cobble Zones + large gravel
			15		SW			<u>SAND</u> : fine to medium grain, minor silt + coarse fractions, light brown, slightly moist, no odor or stain.
			20					(same) slightly coarser
			25					(same) very well graded, semi-rounded quartz sand from silt to coarse sand + gravel.
			30					(same)
			35		SW			(same)

Project Name			Valley te		Project Number		9623 00		Boring/Well Name		B-3	
SAMPLES			Depth (Feet)	WELL CONSTRUCTION		USCS Log	Lithology	OVM	SAMPLE DESCRIPTION and DRILLING REMARKS			
TYPE No.	Recovery (Feet)	P10										
			40			SW						
			45			SW						
			50			SW		16.0				
			55									
			60		B-3-60'	SM		7.7				
			65									
			70		B-3-70' (LAB)	SW		8.3				
			75									
			80		B-3-80' (LAB)	SW		7.7				

APPENDIX B
SOIL SAMPLE GEOTECHNICAL
AND CHEMICAL ANALYSIS REPORT



CORE LABORATORIES

KENNEDY/JENKS CONSULTANTS
KJC PROJECT: VALLEY WASTE-RACE TRACK

CL FILE No.: 57111-96078
KJC PROJECT No.: 962306.00

GEOTECHNICAL ANALYSIS RESULTS

Sample ID	Date/Time Sampled	Permeability Kair md	Total Porosity %	Water Saturation PV%	Bulk Density		Description
					Dry gm/cc	Natural gm/cc	
B-1-10(9.0)	3/13/96 @ 0900	40	30.3	90.8	1.85	2.13	Sand tan vf-vcgr v silty clay incl mica
B-1-70	3/13/96 @ 1130	82	34.0	99.6	1.77	2.11	Sand tan vf-gran v silty clay mica
B-1-70rr		102	26.0	99.9	1.94	2.20	Sand tan vf-gran v silty mica
B-1-80	3/13/96 @ 1205	8131	28.6	41.5	1.90	2.02	Sand tan vf-vcgr sl silty mica
B-2-70	3/14/96 @ 1055	936	26.6	47.9	1.96	2.08	Sand tan vf-vcgr silty mica
B-2-80	3/14/96 @ 1125	7633	28.1	50.7	1.91	2.05	Sand tan vf-pbl sl silty mica
B-3-70	3/15/96 @ 1015	456	26.3	67.9	1.96	2.14	Sand tan vf-gran silty mica
B-3-80	3/15/96 @ 1050	7975	26.4	36.2	1.96	2.05	Sand tan vf-gran sl silty mica

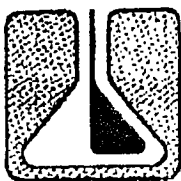
CHEMICAL ANALYSIS RESULTS

Sample ID	Date/Time Sampled	Na EPA 6010 mg/L	Cl EPA 325.3 mg/L	B SM 4500-B mg/L	TRPH EPA 418.1 mg/kg	Specific Conductance EPA 120.1 µmho/cm @ 25°C	Alkalinity by Titration EPA 310.1			pH EPA 9045 pH Units
							Bicarb mg/L	Carb mg/L	OH mg/L	
B-1-10(9.0)	3/13/96 @ 0900	350	5.0	< 0.10	< 12	110	55	30	ND	9.1
B-1-70	3/13/96 @ 1130	380	16.0	< 0.10	< 12	100	ND	30	10	8.3
B-1-70rr		400	15.0	< 0.10	< 12	120	20	10	ND	8.3
B-1-80	3/13/96 @ 1205	250	6.0	< 0.10	< 12	22	< 10	< 10	ND	8.7
B-2-70	3/14/96 @ 1055	220	9.0	< 0.10	< 12	55	14	< 10	ND	8.4
B-2-80	3/14/96 @ 1125	200	8.0	< 0.10	< 12	39	< 10	< 10	ND	8.6
B-3-70	3/15/96 @ 1015	330	10	< 0.10	< 12	50	< 10	ND	ND	8.6
B-3-80	3/15/96 @ 1050	250	9.0	< 0.10	< 12	61	16	14	ND	9.0

The analyses, opinions or interpretations contained in this report are based upon observations and materials submitted by the client for whose exclusive and confidential use this report has been made. The interpretations or opinions expressed represent the best judgment of Core Laboratories. Core Laboratories (however) assumes no responsibility and makes no warranty or representation, express or implied, as to the productivity, proper operations, or profitability of any pit, pits, coal or other mineral property well or sand in connection with which such report is used or relied upon for any reason.

Report To:		Project: Valley Waste - Race Track		Analysis Requested	
Name: Kennedy/Seeks	Project #	962306.00	API-RP 40 package		
Address: 200 New St., #115	Project #	962306.00	No = 200.7		
City: Berkeley	Sampler Name: Ken Knight		CI = 325.3		
State: CA Zip: 93309	Other:		Baron = 4500-B		
Attn: Ken Knight			TRPH = 418.1		
Phone: 835-9785			Spec. Conduct. = 124.1		
			Alkalinity = 310.1		
			pH = 150.1		
Lab#	Sample Description	Date & Time Sampled	Matrix (S) Soil (SL) Sludge (W) Water (Other)		
1	R-1-10'	3.13.96 @ 11.3	S		
2	B-1-70'	3.13.96 @ 12.5	S		
3	B-1-80'	3.13.96 @ 12.5	S		
4	B-2-70'	3.14.96 @ 1.55	S		
5	B-2-80'	3.14.96 @ 1.25	S		
6	B-3-70'	3.15.96 @ 10.15	S		
7	B-3-80'	3.15.96 @ 10.50	S		
Comment: All samples tested for all methods listed above.		Relinquished by: (Signature) <i>Ken Knight</i>			
Billing Info:		Received by: (Signature) <i>Steve R. Hammer</i>			
Name: Kennedy/Seeks Consulting		Date: 3-14-96			
Address: 200 New St., #115		Received by: (Signature)			
City: Berkeley State: CA Zip: 93309		Received by: (Signature)			
Attention: Ken Knight		Received by: (Signature)			
Time:		Received by: (Signature)			
Miles:		Received by: (Signature)			
P.O.#		Received by: (Signature)			
Sample Disposal		Date: Time:			
BC Disposal @ 5.00 ea.		Date: Time:			
Return to client		Date: Time:			

APPENDIX C
PRODUCED WATER
CHEMICAL ANALYSIS REPORT



ZALCO LABORATORIES, INC.

Analytical & Consulting Services

4309 Armour Avenue
Bakersfield, California 93308

(805) 395-0539
FAX (805) 395-3069

Valley Waste Disposal
1400 Easton Drive, Suite 139B
Bakersfield, CA 93389

Laboratory No: 60008-3
Date Received: 10-2-95
Date Reported: 10-10-95

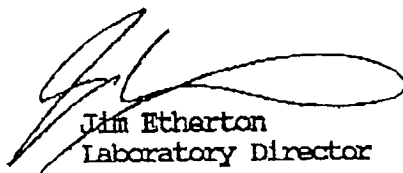
Attention: Larry Bright

Sample Identification: Racetrack A Section
Sampled by Larry Bright on 10-2-95

IRRIGATION WATER ANALYSIS

pH 8.2
Electrical Conductivity, EC
(millimhos/cm @ 25 C) 6.87

Constituents	mg/l	meq/l
Calcium, Ca	170	8.48
Magnesium, Mg	13	1.07
Sodium, Na (calculated)	1300	55.77
Potassium, K	16	0.41
Alkalinity as:		
Hydroxide, OH	0	0
Carbonate, CO ₃	0	0
Bicarbonate, HCO ₃	480	7.94
Chloride, Cl	2000	57.79
Sulfate, SO ₄	< 5.0	0
Nitrate, NO ₃	< 1.0	0
Totals (Sum)	3800	131.46
Boron, B	13	
Total Dissolved Solids, (Grav)	3900	
Calculated Hardness, CaCO ₃	480	
Sodium Adsorption Ratio, SAR	25.5	
Exchangeable Sodium Percentage, ESP	26.7	
Cation/Anion Balance, %	0.29	
Sodium, Na (determined), mg/l	1300	
Langelier Scale Index	1.70	
Gypsum Requirement, lbs/ac-ft	0	


Jim Etherton
Laboratory Director